DISCUSSION OF THE CLAIMS

Claims 1-6, 8-9, 11-12, 14-29, 32-37 and 39-51 are pending in the present application.

Claims 7, 10, 13, 30-32 and 38 are canceled claims. Claims 41-51 are new claims. Support

for the new dependent Claims 41 and 42 is found in Example 1 of the specification. Support

for new Claims 43-51 is found in original Claims 30-32 and 38.

No new matter is added.

REMARKS

Applicants have disclosed and claimed a catalytic composition wherein a certain fraction of the pore volume is attributable to pores having relatively large diameter. Present Claim 1 recites that 30% of the pore volume (i.e., the pore volume obtained by adding the mesoporosity and macroporosity fractions) of the claimed catalytic composition consists of pores having a diameter of greater than 100 nm (e.g., the pore volume is attributable to pores having a diameter of greater than 100 nm).

Applicants have disclosed that the zeolite Y-containing catalytic composition of the present claims provides excellent transalkylation performance while concurrently, and unexpectedly, provides improved mechanical characteristics such as improved crush strength. In this regard, Applicants draw the Office's attention to original dependent Claim 2 which recites a minimum crush strength of 1.7 kg/mm (i.e., 17 kg/cm) and new dependent Claim 41 which recites a minimum crush strength of 2.1 kg/mm (i.e., 21 kg/cm).

Applicants submit that those of ordinary skill in the art would not have foreseen that a catalytic composition having a relatively higher percentage of pore volume derived from larger diameter pores would provide good transalkylation performance and, concurrently, provide improved crush strength.

Applicants submit that the transalkylation performance and improved crush strength demonstrated for the claimed catalytic compositions of the present specification is probative of the non-obviousness of the claimed invention and respectfully request withdrawal of the rejection over Girotti (EP 0847802) set forth in the Office Action of June 18, 2008.

Applicants compare the catalytic composition of the present claims with one or more of the catalytic compositions of Girotti in the tables below.

Table 1

	Girotti Catalyst	Claimed catalyst
Zeolite	Zeolite beta	Zeolite Y
Binder	Inorganic binder	γ-alumina
Pore volume (V) (mesoporosity + macroporosity)	$\geq$0.8 ml/g	$\geq$0.7 ml/g
Porosity composition (V) expressed in radius (r)	$\geq$25% with r> 100 Å	$\geq$30% with r> 500 Å

Table 1 provides a comparison of the properties of a catalyst encompassed by the claims of the Girotti patent and a catalyst according to the claims of the present claims. Table 1 demonstrates that there are differences between the catalyst of the present claims and the Girotti catalyst. For example, the Girotti catalyst includes a zeolite that is different from the zeolite Y of the present claims.

The Office asserts that Girotti's disclosure of a pore volume wherein at least 25% of the pore volume is derived from pores having a pore radius of greater than 100Å renders obvious the catalytic composition of the present claims in which at least 30% of the pore volume recited in the claims is derived from pores having a diameter of greater than 100 nanometers.

For the sake of convenience and clarity, from this point forward the requirement of the present claims that "at least 30% of said volume consists of pores with a diameter greater than 100 nm" will be expressed in the dimensional units described in Girotti. Thus, the afore-quoted feature of the present claims is equivalent to "at least 30% of said volume consists of pores with a radius greater than 500Å".

Table 2 below compares the performance characteristics of the Girotti catalyst A1 with the catalyst of Examples 1 and 3 of the present specification.

Table 2

|	Girotti Catalyst A1	Catalyst example 1 present spec.	Catalyst example 3 present spec.
Zeolite	Zeolite beta	Zeolite Y	Zeolite Y
Binder	Alumina	γ-alumina	γ-alumina
Pore volume (V) (mesoporosity+macroporosity)	0.81 ml/g	0.84 ml/g	0.44 ml/g
Porosity with r > 100Å	41%	47.7%	31.8%
Porosity with r > 500Å	2.4%	34.5%	0.04%
Crushing strength	13 kg/cm	21 kg/cm	14 kg/cm

Table 2 shows some key differences between the inventive catalyst of Example 1 of the present invention, the Girotti catalyst A1, and the catalyst of Example 3 of the present specification (i.e., a comparative example). Based on the Office's logic these catalysts should be the same, or obvious over one another, because they each meet the requirement that at least 25% of the pore volume is derived from pores having a radius of greater than 100Å (see the third to the last row of Table 2). However, as shown in the second to the last row of Table 2, only inventive Example 1 of the present specification meets the requirement of the present claims that at least 30% of the volume of the pores is derived from pores having a pore radius of greater than 500Å. In fact, Table 2 makes it plainly apparent that there are substantial differences in this value between the catalyst of Girotti and the comparative catalyst of Example 3 of the present specification.

Surprisingly, the inventive catalyst of Example 1 of the present specification has a crushing strength that is substantially larger than the crushing strength of the Girotti catalyst A1 and the comparative catalyst of Example 3 (compare a crushing strength of 21 kg/cm for the inventive example with crushing strengths of 13 kg/cm and 14 kg/cm for the Girotti and Example 3 catalysts, respectively).

Applicants submit that those of ordinary skill in the art readily recognize that crushing strength of catalytic compositions is *expected to decrease* as the pore radius of the pores

present in the catalytic composition increases. As evidence in support Applicants draw the

Office's attention to the examples of <u>Girotti</u>.

Catalyst A1 of <u>Girotti</u> is described in Figure 2 which provides a particle size

distribution (PSD) of the A1 catalyst (see below). Likewise, Figure 4 of <u>Girotti</u> provides a

particle size distribution of the catalyst A2. It is readily evident from a comparison of

Figures 2 and 4 of <u>Girotti</u> that the catalyst A1 has a larger average pore radius than catalyst

A2 of <u>Girotti</u>. For example, the PSD curve of catalyst A2 is biased towards the left axis

representing smaller pore radius in comparison to the PSD curve of catalyst A1.
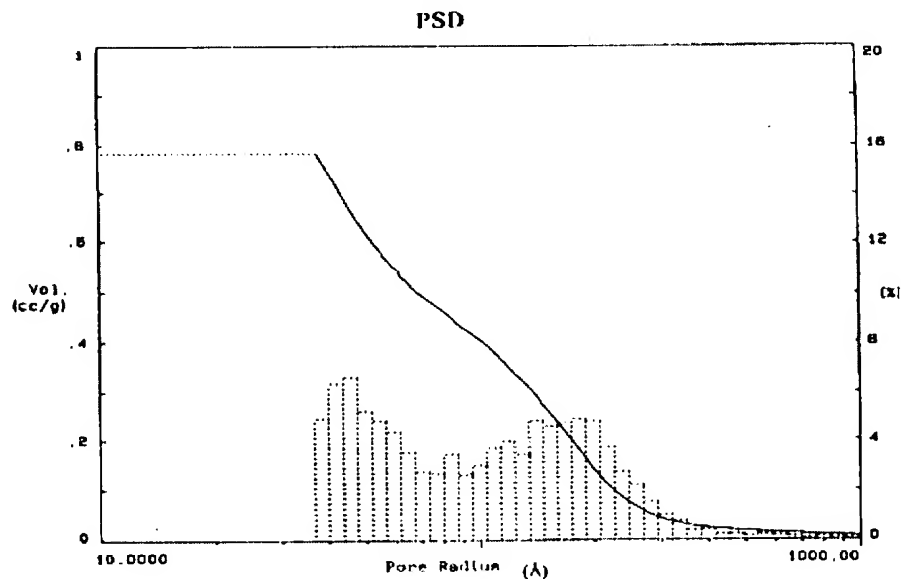
<u>Girotti</u> - Figure 2
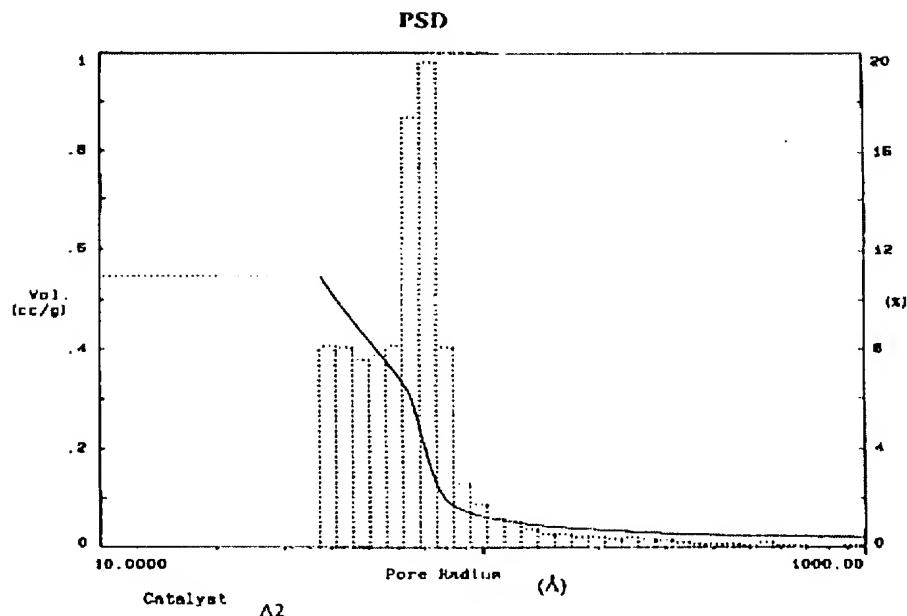
Girotti - Figure 4

Table 1 on page 12 of Girotti (see below) provides the crushing strength of catalysts

A1 and A2. Catalyst A1, which has a larger average pore radius, has a lower crushing

strength than catalyst A2.

TABLE I

	Catalyst A1	Catalyst A2	Catalyst A3	Catalyst A (***)
Catalyst preparation data				
Ligand content (w/w%)	50	50	50	50
Peptizing agent	Acetic acid	Acetic acid	Acetic acid	Acetic acid
Peptizing agent/ligand (w/w)	0 028	0 058	0.121	0.034
Mixing time before extrusion (*)	45	55	55	55
Calcination temperature (°C)	550	550	550	550
Catalyst data				
Spec surf area (N₂ ads BET 3 param.)	482	463	468	460
Extrazeolite Pore Volume EPV (cc/g) (**)	0.81	0 58	0 23	0.40
EPV fraction with 15 A < pare radius < 100 A	0.41	0 52	0.16	0.14
EPV fraction with 100 A < pare radius < 1000 A	0 39	0 04	0.07	0.25
EPV fraction with 1000 A < pare radius < 75000 A	0 01	0 02	0	0 01
Crushing strength along the diameter (Kg/cm)	13	15 1	19	7

(*) Dry powders mixing time + damp powders mixing time
(**) 15 A < Pore radius < 75000 A
(***) From EP 0 678 500 A1, Ex 1 page 6 and table I page 10

Likewise, as shown in Applicants' Table 2 above, this principle of increased crushing

strength corresponding with decreased pore radius is demonstrated by Comparative Example

3 of the present specification, i.e., as the relative amount of pore volume derived from pores having a pore radius of greater than 500Å decreases, the crushing strength increases.

Applicants now provide further comparative examples in which a transalkylation reaction of a polyethyl benzene is carried out in the same manner as described in Example 2 of the present specification, however, a beta-zeolite based catalyst Z according to Girotti publication is used. Catalyst Z had the following properties:

extrazeolitic volume = 0.81 cc/g
crushing strength = 10.5 kg/cm
porosity with radius higher than 100Å = 53%
porosity with radius higher than 500Å = 3.3%.

After some hours of test a first sampling was made and, based on a GC analysis, the conversion of polyethylbenzenes was as low as about 5 %, which is very low from an industrial point of view. The test was then stopped as the conversion was really too low to going further with the test and eventually with another sampling.

A second test was then carried out at the same conditions than the previous one, except for what relates to the temperature, which was increased to 270°C, higher than the 210°C used for the first test.

When a productivity of about 20 g of ethylbenzene per g of catalyst was reached, the conversion of polyethylbenzenes was equal to 56.3%, while when a productivity of 150 g of ethylbenzene per g of catalyst was reached, the conversion dropped to 47.8%.

With the zeolite beta based Catalyst Z of Girotti, a temperature of 60°C higher than that used for the present inventive catalytic composite is necessary to effectively carry out a transalkylation reaction. Even at this higher temperature the conversion is greatly reduced compared to the example 2 of the present invention by 20%, and furthermore a very high deactivation rate is observed.

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Applicants thus submit that the catalytic composition of Claim 1 is not obvious over the art relied on by the Office. In view of the non-obviousness of the subject matter of Claim 1, those claims drawn to processes of using and/or making the claimed catalyst should also be held patentable (see Claims 14, 18 and 27).

For the reasons discussed above in detail, Applicants request withdrawal of the

rejection and the allowance of all now-pending claims.

Respectfully submitted,

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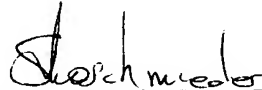Fax: (703) 413 -2220
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